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JUN 25 2007

10CFR50.73

LR-N07-0157

U.S. Nuclear Regulatory Commission
ATTN: Document Control Desk
Washington DC 20555-001

LER 272/07-002
Salem Nuclear Generating Station Unit 1
Facility Operating License No. DPR-70
NRC Docket No. 50-272

SUBJECT: Manual Reactor Trips Due to Degraded Condenser Heat Removal

This Licensee Event Report, "Manual Reactor Trips Due to Degraded Condenser Heat Removal " is being submitted pursuant to the requirements of the Code of Federal Regulations 10CFR50.73(a)(2)(iv)(A).

The attached LER contains no commitments. Should you have any questions or comments regarding this submittal, please contact Mr. E. H. Villar at 856-339-5456.

Sincerely,

George Gellrich

George H. Gellrich
Salem – Plant Manager

Attachments (1)

IE22

NRR

JUN 2 5 2007

cc Mr. S. Collins, Administrator - Region I
U. S. Nuclear Regulatory Commission
475 Allendale Road
King of Prussia, PA 19406

Mr. R. Ennis, Licensing Project Manager - Salem
U. S. Nuclear Regulatory Commission
Mail Stop 08B1
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USNRC Senior Resident Inspector - Salem (X24)

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Trenton, NJ 08625

NRC FORM 366 (6-2004) U.S. NUCLEAR REGULATORY COMMISSION

APPROVED BY OMB: NO. 3150-0104 EXPIRES: 06/30/2007

Estimated burden per response to comply with this mandatory collection request: 50 hours. Reported lessons learned are incorporated into the licensing process and fed back to industry. Send comments regarding burden estimate to the Records and FOIA/Privacy Service Branch (T-5 F52), U.S. Nuclear Regulatory Commission, Washington, DC 20555-0001, or by internet e-mail to infocollects@nrc.gov, and to the Desk Officer, Office of Information and Regulatory Affairs, NEOB-10202, (3150-0104), Office of Management and Budget, Washington, DC 20503. If a means used to impose an information collection does not display a currently valid OMB control number, the NRC may not conduct or sponsor, and a person is not required to respond to, the information collection.

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4. TITLE Manual Reactor Trips Due to Degraded Condenser Heat Removal

5. EVENT DATE			6. LER NUMBER			7. REPORT DATE			8. OTHER FACILITIES INVOLVED	
MONTH	DAY	YEAR	YEAR	SEQUENTIAL NUMBER	REV NO.	MONTH	DAY	YEAR	FACILITY NAME	DOCKET NUMBER
04	24	2007	2007	002	00	06	25	2007	FACILITY NAME	DOCKET NUMBER

9. OPERATING MODE

1

10. POWER LEVEL

40%

11. THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR§: *(Check all that apply)*

- ☐ 20.2201(b)
- ☐ 20.2201(d)
- ☐ 20.2203(a)(1)
- ☐ 20.2203(a)(2)(i)
- ☐ 20.2203(a)(2)(ii)
- ☐ 20.2203(a)(2)(iii)
- ☐ 20.2203(a)(2)(iv)
- ☐ 20.2203(a)(2)(v)
- ☐ 20.2203(a)(2)(vi)
- ☐ 20.2203(a)(3)(i)
- ☐ 20.2203(a)(3)(ii)
- ☐ 20.2203(a)(4)
- ☐ 50.36(c)(1)(i)(A)
- ☐ 50.36(c)(1)(ii)(A)
- ☐ 50.36(c)(2)
- ☐ 50.46(a)(3)(ii)
- ☐ 50.73(a)(2)(i)(A)
- ☐ 50.73(a)(2)(i)(B)
- ☐ 50.73(a)(2)(i)(C)
- ☐ 50.73(a)(2)(ii)(A)
- ☐ 50.73(a)(2)(ii)(B)
- ☐ 50.73(a)(2)(iii)
- ☒ 50.73(a)(2)(iv)(A)
- ☐ 50.73(a)(2)(v)(A)
- ☐ 50.73(a)(2)(v)(B)
- ☐ 50.73(a)(2)(v)(C)
- ☐ 50.73(a)(2)(v)(D)
- ☐ 50.73(a)(2)(vii)
- ☐ 50.73(a)(2)(viii)(A)
- ☐ 50.73(a)(2)(viii)(B)
- ☐ 50.73(a)(2)(ix)(A)
- ☐ 50.73(a)(2)(x)
- ☐ 73.71(a)(4)
- ☐ 73.71(a)(5)
- ☐ OTHER

Specify in Abstract below or in NRC Form 366A

12. LICENSEE CONTACT FOR THIS LER

FACILITY NAME	TELEPHONE NUMBER (Include Area Code)
Enrique Villar, Senior Licensing Engineer	856-339-5456

13. COMPLETE ONE LINE FOR EACH COMPONENT FAILURE DESCRIBED IN THIS REPORT

CAUSE	SYSTEM	COMPONENT	MANU-FACTURER	REPORTABLE TO EPIX	CAUSE	SYSTEM	COMPONENT	MANU-FACTURER	REPORTABLE TO EPIX
C	KE	-	-	N					

14. SUPPLEMENTAL REPORT EXPECTED

☐ YES *(If yes, complete 15. EXPECTED SUBMISSION DATE)* ☒ NO

15. EXPECTED SUBMISSION DATE

MONTH	DAY	YEAR

ABSTRACT *(Limit to 1400 spaces, i.e., approximately 15 single-spaced typewritten lines)*

On April 24, 2007 at approximately 2248, a manual reactor trip was initiated with reactor power level at approximately 40%. The manual reactor trip was initiated in response to a degraded Circulating Water System (CWS) and in accordance with operating procedures. The degradation of the CWS was due to extremely heavy river debris loadings that affected the ability of plant equipment to operate under the condition.

The unit was returned to service on April 26, 2007 at 1236 following the cleaning of the condenser water boxes and lowering river debris conditions.On April 30, 2007, at approximately 1502, with the unit at approximately 80% power a sudden localized high amount of river water debris again affected the CWS intake resulting in the loss of four (4) circulating water pumps due to high screen differential levels, and a manual reactor trip.

The cause of manual reactor trips is attributed to unusual and severe external environmental conditions resulting in record high amounts of river debris loadings, which challenged the design of the CWS. Following cleaning and inspection of the Circulating Water Traveling Screens, condenser waterboxes, and lowering river debris conditions the unit was returned to service on May 3, 2007 at 0310. A root cause investigation has been initiated to improve the plant operation and to minimize challenges to the CWS design by: (a) Improving predictive tools and actions on high river debris conditions, and (b) Improving the availability and reliability of the Circulating Water System.

This report is being made in accordance with 10CFR50.73(a)(2)(iv)(A), "any event or condition that resulted in manual or automatic actuation of any of the systems listed in paragraph (a)(2)(iv)(B)...."

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17. NARRATIVE *(If more space is required, use additional copies of NRC Form 366A)*

PLANT AND SYSTEM IDENTIFICATION

Westinghouse – Pressurized Water Reactor (PWR/4)

Reactor Protection System (JC/-)
Circulating Water System (KE/ SCN)

* Energy Industry Identification System {EIIS} codes and component function identifier codes appear as {SS/CCC}

IDENTIFICATION OF OCCURRENCE

Event Date: April 24 and 30, 2007

Discovery Date: April 24 and 30, 2007

CONDITIONS PRIOR TO OCCURRENCE

Salem Unit 1 was in Operational Mode 1 at 40% reactor power prior to the April 24 trip and in Operational Mode 1 at 80% reactor power prior to the April 30 trip.

No structures, systems or components were inoperable at the time of the discovery that contributed to the event.

DESCRIPTION OF OCCURRENCE

On April 24 and 30, 2007, Salem Unit 1 was removed from service due to the loss of Circulating Water Pumps. During both events the Salem Station was experiencing extremely heavy river debris loadings that affected the ability of plant equipment to function. The heavy loadings overwhelmed the Circulating Water Traveling Screens (CWTS) {SCN}, causing high differential levels. Screen differential levels of 10' across the CWTS causes a trip of the Circulating Water Pumps.

On April 24, 2007 at approximately 2248, a manual reactor trip was initiated with reactor power level at approximately 40%. The manual reactor trip was initiated in response to a degraded Circulating Water {KE/}(CW) system and in accordance with operating procedures. At the time of this trip, Abnormal Operating Procedure S1.OP-AB.CW-0001 *Circulating Water System Malfunction* was in effect because two (2) of the six (6) CW pumps were out of service. One CW pump had been taken out of service to allow plant personnel to clean the associated condenser water box, and another CW pump had tripped due to high differential levels across its associated traveling screen. When the licensed Plant Operator (PO) noted a rapid increase in differential levels on the remaining four CW traveling screens, a manual reactor trip was initiated per procedure.

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17. NARRATIVE *(If more space is required, use additional copies of NRC Form 366A)*

DESCRIPTION OF OCCURRENCE (Cont'd)

Unit 1 was returned to service (synchronized to the grid) on April 26, 2007 at 1236, following the cleaning of water boxes and the lowering of river debris levels.

On April 30, 2007, at approximately 1502, with the unit at approximately 80% power a sudden localized high amount of river water debris affected the CWTS in a very short time resulting in the loss of four (4) CW pumps due to high screen differentials. A manual reactor trip was initiated in accordance with the abnormal operating procedure due to the loss of the CW pumps.

Both reactor trips were uncomplicated; the unit was stabilized in Mode 3 with the reactor at normal operating temperature and pressure with core cooling provided by the Auxiliary Feedwater System.

This report is being made in accordance with 10CFR50.73(a)(2)(iv)(A), "any event or condition that resulted in manual or automatic actuation of any of the systems listed in paragraph (a)(2)(iv)(B)...."

PREVIOUS OCCURRENCES

A review of LERs at Salem Station dating back to 2003 identified one other occasion of a reactor trip due to excessive grassing. LER 311/2003-001 "Manual Reactor Trip Due to Degradation of Condenser Heat Removal, " was initiated March 29, 2003. As part of the corrective actions of this LER, a Circulating Water/Service Water project was established to improve the response and reliability of the CW system. The corrective actions associated with this LER would not have prevented the occurrence of these events. Various upgrades and improvements were made which proved beneficial to the station as demonstrated by successfully operating through the high detritus levels of 2005. The magnitude and severity of the grassing experienced in 2007 were the result of a combination of unusual and severe external environmental conditions.

CAUSE OF OCCURRENCE

The cause of manual reactor trips is attributed to unusual and severe external environmental conditions resulting in record high amounts of river debris loadings. The heavy amount of debris loading caused the high differential levels across the CWTS. A screen differential level of 10' across the CWTS causes a trip of the CW Pumps.

During the period from April 14 through 16, 2007, the Delaware River drainage area received excessive rainfalls. These rainfall amounts led to significantly increased Delaware River flows and several dams on tributaries leading to the Delaware River were required to release significant quantities of water. Additionally, there were high winds during and after the storm, as well as exceptionally high tides due to lunar influence on a 10-year cycle. All these conditions combined to flush the various marshes, riverbanks, and low-lying areas, producing a record amount of detritus that was sustained over a period of greater than one (1) week. The weekly rolling average of detritus was approximately 30% higher than the previous record high in 2005.

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U.S. NUCLEAR REGULATORY COMMISSION

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SAFETY CONSEQUENCES AND IMPLICATIONS

There were no actual safety consequences associated with this event. Operators appropriately responded to the degraded CWS (loss of circulating water pumps) and the potential loss of normal heat sink (condenser) by manually tripping the reactor. Plant response to the manual reactor trips was normal. All safety systems operated as required.

A review of this event determined that a Safety System Functional Failure (SSFF) as defined in NEI 99-02, Regulatory Assessment Performance Indicator Guidelines, did not occur. There was no condition that alone could have prevented the fulfillment of a safety function of a system needed to remove residual heat.

CORRECTIVE ACTIONS

1. Circulating Water traveling screens and condenser waterboxes were cleaned, inspected and returned to service.

2. A root cause evaluation was initiated to identify causes and initiate corrective actions that can be made to:

   a) Improve predictive tools and actions on high river debris conditions, and

   b) Further improve the availability and reliability of the Circulating Water System.

COMMITMENTS

No commitments are made in this LER.